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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,934	08/21/2003	Jun-Ichi Yamato	Q76950	7364

23373 7590 06/07/2007
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EXAMINER

MEHRMANESH, ELMIRA

ART UNIT	PAPER NUMBER
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2113

MAIL DATE	DELIVERY MODE
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06/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/644,934

Applicant(s)

YAMATO ET AL.

Examiner

Elmira Mehrmanesh

Art Unit

2113

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 22-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-20, 22-26, 28, 30 and 32-34 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-16, and 27-29 is/are rejected.
- 7) ☒ Claim(s) 3, 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Final Rejection

This action is in response to an amendment filed on March 12, 2007 for the application of Yamato et al., for a "Data copying system, relaying device, data transfer/reception system and program for copying of data in storage unit" filed August 21, 2003.

Claims 1-20, and 22-34 are pending in the application.

Claims 1, 2, 4-16, and 27-29 are rejected under 35 USC § 103.

Claims 17-20, 22-26, 30, and 32-34 are allowed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 4-16, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staheli et al. (U.S. Patent No. 5,537,533) in view of Fukuhara et al. (U.S. Patent No. 6,760,861).

As per claim 1, Staheli discloses a data copying system comprising:

a first storage unit (Fig. 1, element 16)

a second storage unit (Fig. 1, element 20)

data stored in said first storage unit being copied by mirroring or backup to said second storage unit (col. 8, lines 49-55) over a communication network (Fig. 1, element 50)

a relaying device for relaying data (Fig. 1, elements 30, 40) transferred from said first storage unit (Fig. 1, element 16) to said second data storage unit (Fig. 1, element 20) over the communication network (Fig. 1, element 50)

said relaying device being provided in a location pre-calculated so that, even if said first storage device cannot be operated due to a disaster, the operation of said relaying device can be continued (col. 15, lines 2-7)

wherein said first storage unit includes data transfer processing means for controlling data transfer, said data transfer processing means regarding the data transfer from said first storage unit to said second storage unit as being completed when data transfer from said first storage unit to said relaying device is completed (col. 12, lines 2-11).

Staheli fails to explicitly disclose a relaying device in a different location.

Fukuhara teaches:

A relaying device being provided in a location that is pre-calculated and different from a location of said first and second storage units (col. 18, lines 23-34).

It would have been obvious to one of ordinary skill in the art at the time the invention to use the method of remote mirroring of digital data of Staheli et al. in combination with the system of providing continuous operation independent of device failure or disaster of Fukuhara et al. to effectively recover from failure/disasters. One of ordinary skill in the art at the time the invention would have been motivated to make the combination because Staheli et al. discloses a system for remote mirroring of digital data from a primary network server to a remote replacement network server (Fig. 1). Fukuhara et al. discloses a system and method for data processing and/or data storage, which provides continuous computing operations independent of device failures or unavailability (col. 4, lines 65-67 through col. 5, lines 1-7).

As per claim 2, Staheli discloses said relaying device includes:

non-volatile storage means for storing a command and data received from the first storage unit (Fig. 2, elements 66, 68)

relaying processing means for relay controlling the data, said relaying processing means causing the command and the data received from said first storage unit to be stored in said non-volatile storage means and transmitting the command and data stored in said non-volatile storage means to said second storage unit at an optional timing (col. 14, lines 36-53).

As per claim 4, Staheli discloses a relaying device (Fig. 1, element 30) for relaying data transferred from a first storage unit (Fig. 1, element 16) to a second storage unit (Fig. 1, element 20), said relaying device comprising:

storage means for storing data received from said first storage unit (Fig. 2, elements 66, 68) and (col. 14, lines 36-53)

relaying processing means for relay controlling data (Fig. 1, elements 30, 40)

wherein said relaying processing means causes data received from said first storage unit to be stored in said storage means (col. 14, lines 36-53)

wherein, when the data is stored in said storage means, said relaying processing means sends a response (col. 12, lines 2-11) to said first storage unit and sends the data stored in said storage means to said second storage unit (col. 13, lines 12-18).

Staheli fails to explicitly disclose a relaying device in a different location.

Fukuhara teaches:

Wherein said relaying device is provided in a location that is pre-calculated and different from a location of said first and second storage units, so that, even if said first storage device cannot be operated due to a disaster, the operation of said relaying device can be continued (col. 18, lines 23-34).

As per claim 5, Staheli discloses a transmitting/receiving method, in which data transmitted from a source unit (Fig. 1, element 10) is received by a destination unit (Fig. 1, element 12), said method comprising the steps of:

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said source unit creating at least one redundant data for error correction from original data to be transmitted (Fig. 3)

Staheli fails to explicitly disclose transmitting data in separate data transmission units.

Fukuhara teaches:

said source unit transmitting the original data and the redundant data in separate data transmission units (Fig. 6 and 7) and (Fig. 5, element 124).

As per claim 6, Staheli discloses said destination unit (Fig. 1, element 12) executing error correction processing before completion of reception of an entire assemblage of data (col. 6, lines 7-15) comprised of a set of the original data and the redundant data, at a stage when a portion of said data set enabling partial error correction of said original data is received. Figure 4, shows events involved in receiving a packet of mirrored data sent from the primary data transfer unit over the communication link to the remote data transfer unit.

As per claim 7, Staheli discloses said source unit dividing the original data into divided data and creating redundant data which enables restoration of the original data even on occurrence of loss of one or more of said divided data (col. 12, lines 12-30).

As per claim 8, Staheli discloses parity data or ECC (Error Correction Code) is used as said redundant data (col. 12, lines 39-48).

As per claim 9, Staheli discloses copied data of transmission data is used as said redundant data (col. 14, lines 36-43).

As per claim 10, Staheli discloses the original data and the redundant data are sent over separate communication networks (Fig. 1, elements 30, 40 and 50). Figure 1, shows link interfaces 34 and 44 as a part of the relay devices 30 and 40.

As per claim 11, Staheli discloses a data copying system comprising:
a first storage unit (Fig. 1, element 16)
and a second storage unit (Fig. 1, element 20)
data stored in said first storage unit being copied by mirroring or backup to said second storage unit (col. 8, lines 49-55) over a communication network (Fig. 1, element 50)

wherein said first storage unit includes: data transfer processing means for controlling data transfer and redundancy processing means for creating at least one redundant data for error correction from the original data to be transmitted (col. 12, lines 39-48)

Staheli fails to explicitly disclose transmitting data in separate data transmission units.

Fukuhara teaches:

said source unit transmitting the original data and the redundant data in separate data transmission units (Fig. 6 and 7) and (Fig. 5, element 124).

As per claim 12, Staheli discloses data restoration means for executing error correction processing using the redundant data received from said first storage unit (col. 6, lines 7-23)

and storage processing means for storing the data restored by said data restoration means on a recording medium (Fig. 2, element 66)

wherein said data restoration means executes error correction processing before completion of reception of an entire assemblage of data comprised of a set of the original data and the redundant data, at a stage when a portion of said data set enabling partial error correction of said original data is received (col. 6, lines 7-23).

As per claim 13, Staheli discloses said redundancy processing means in said first storage unit divides said original data into divided data and creates redundant data which enables restoration of the original data even on occurrence of loss of one or more of said divided data (col. 12, lines 12-30).

As per claim 14, Staheli discloses said redundancy processing means uses parity data or ECC (Error Correction Code) as said redundant data (col. 12, lines 39-48).

As per claim 15, Staheli discloses said redundancy processing means uses copied data of transmission data as said redundant data (col. 14, lines 36-43).

As per claim 16, Staheli discloses said data transfer processing means sends the original data and the redundant data over separate communication network (Fig. 1, elements 30, 40 and 50). Figure 1, shows link interfaces 34 and 44 as a part of the relay devices 30 and 40.

As per claim 27, Staheli discloses a computer program product comprising a computer usable medium having computer readable program code therein, said program code causing a computer provided in a relaying device in a data copying system,

in which data in a first storage unit is copied by mirroring or backup to a second storage unit (col. 8, lines 49-55) via a communication network (Fig. 1, element 50)

and the relaying device (Fig. 1, elements 30,40) to execute the steps of: causing storage of data received from said first storage unit in a recording medium in the relaying device; sending a response (col. 12, lines 2-11) to said first storage unit on storage of data in said recording medium in said relaying device; and sending the data stored in the recording medium in the relaying device to said second storage unit (col. 12, lines 2-11)

Staheli fails to explicitly disclose a relaying device in a different location.

Fukuhara teaches:

Wherein said relaying device is provided in a location that is pre-calculated and different from a location of said first and second storage units, so that, even if said first storage device cannot be operated due to a disaster, the operation of said relaying device can be continued (col. 18, lines 23-34).

As per claim 28, Staheli discloses a computer program product comprising a computer usable medium having computer readable program code therein, said program code causing a computer provided in a first storage unit (Fig. 1, element 16) in a data copying system, in which data in the first storage unit is copied by mirroring or backup to a second storage unit (col. 8, lines 49-55) via a communication network (Fig. 1, element 50) to execute the steps of: forming at least one redundant data for error correction from transmitted original data (col. 6, lines 7-23)

Staheli fails to explicitly disclose transmitting data in separate data transmission units.

Fukuhara teaches:

said source unit transmitting the original data and the redundant data in separate data transmission units (Fig. 6 and 7) and (Fig. 5, element 124).

As per claim 29, Staheli discloses a computer program product comprising a computer usable medium having computer readable program code therein, said program code causing a computer provided in an operation storage unit in a data copying system, in which data in the operation storage unit is copied by mirroring to a

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standby storage unit (col. 8, lines 49-55) via a communication network (Fig. 1, element 50) to execute the steps of: sending data to be written and a delay write request instructing storage of the data in a temporary storage device to said storage unit of the standby system, on occurrence of a data write request; sending to said storage unit of the standby system a delay write execution request instructing storage in the recording medium of data stored in the temporary storage device on receipt from a higher rank device of a restart enabling point notification asserting a restart enabling point for which an application may directly restart operation for prevailing data state (col. 6, lines 24-34)

Staheli fails to explicitly disclose a relaying device in a different location.

Fukuhara teaches:

Wherein said relaying device is provided in a location that is pre-calculated and different from a location of said first and second storage units, so that, even if said first storage device cannot be operated due to a disaster, the operation of said relaying device can be continued (col. 18, lines 23-34).

Allowable Subject Matter

Claims 3 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

After a complete search of all the relevant prior art the examiner has determined the claims are in condition for allowance. The following limitations when viewed in combination with the remainder of the claim as a whole, place this application in condition for allowance.

As per claim 17, the examiner finds the novel and non obvious feature of these claims, when read as a whole to be the write execution requesting means for sending a delay write execution request to said storage unit of the standby system on receipt from a higher rank device of a restart enabling point notification asserting a restart enabling point for which an application may directly restart operation for prevailing data state.

As per claims 20 and 30, the examiner finds the novel and non obvious feature of these claims, when read as a whole to be the snap shot formation requesting means for sending a snap shot forming request to said storage unit of the standby system on receipt from a higher rank device of a restart enabling point notification asserting a restart enabling point for which an application may directly restart operation for prevailing data state.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed March 12, 2007 with regards to claims 1, 4-16, and 27-29 have been fully considered but they are not persuasive.

As per claims 1, 4, 27, and 29, in response to applicant's arguments that Fukuhara's multicasting engine fails to teach the claimed relaying device, the Examiner respectfully disagrees and would like to point out to figure 23, wherein Fukuhara discloses a multicasting engine 360 may be provided to communicate between the server 350 and the pairs of listening devices 356, 358 and storage devices 352, 354. Accordingly, when the server 350 writes data, for instance, the multicasting engine 360 receives the write request and transmits or multicasts the write request over a network 362 to at least two listening devices 356, 358, which each independently and completely process the write request and write the data to their respective persistent storage device 352, 354 (col. 18, lines 55-65).

The multicasting engine 360 receives data from server 350 and transfers the data to storage devices 352, 354 through listening devices 356, 358. Therefore the multicasting engine and the listening devices relay data from one source of data storage (i.e. server 350) to other storage devices (i.e. storage devices 352, 354).

As per claims 5, 11, and 28, in response to applicant's arguments that Fukuhara fails to teach sending original and redundant data for error correction in separate transmission units, the Examiner respectfully disagrees and would like to point out that data is transferred from a source unit (i.e. servers 36A, 36B, 36C) to a destination (i.e. multicasting engine 30). Servers process user requests and return the results to the

multicasting engine in a redundant manner (col. 7, lines 7-16). The servers store a redundant copy of the result sent to the multicasting engine in their storage devices 38 (Fig. 1). Fukuhara further discloses retransmission of data in case of error (col. 15, lines 11-16). Maintaining a redundant copy of the messages/results transmitted between the servers and the multicasting engine provides error correction processing capabilities (col. 7, lines 16-21).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elmira Mehrmanesh whose telephone number is (571) 272-5531. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



EXAMINER
UNIT 2100